

complished, and I believe it safe to say that the work of the Weather Bureau has thus been brought before a large number of representative farmers of east Tennessee in such a manner as to enlist a lively interest in the service on their part and to awaken in them a due appreciation of the benefits it offers.

By a similar arrangement between the Chief of the Weather Bureau and Mr. Charles R. Skinner, Superintendent of Public Instruction for the State of New York, Mr. A. F. Sims, Local Forecast Official at Albany, was authorized to attend and lecture at the State summer institutes held at Chataqua, N. Y., and Thousand Island Park, N. Y., during the month of July. About a thousand teachers assembled at each of these summer institutes. The lectures were fully illustrated and devoted especially to the methods of teaching meteorology and were very well received. They were an elaboration of the many similar lectures given by him with great success to the schools of Albany.

#### MINIMUM TEMPERATURES ON MOUNTAIN PEAKS.

In the August Report of the California Section, Mr. McAdie publishes a note from Prof. J. N. Le Conte, Professor of Engineering in the University of California, giving the results of observations on the summit of Mount Lyell, on the Sierra Nevada Mountains of Central California, latitude,  $37^{\circ} 44' N.$ ; longitude,  $119^{\circ} 16' W.$ ; altitude, 13,041 feet.

On July 8, 1897, Professor Le Conte left a minimum thermometer of the United States Weather Bureau pattern on the summit. It was enclosed in a thin wooden box about 6 inches square and 2 feet long, one side of which was laid exactly in line with the edge of the great southern precipice, over 1,500 feet high. Large stones were laid upon it, but one side was exposed to the weather, and in no way could it become entirely covered with snow. On June 5, 1898, the mountain was revisited, and the thermometer box was carefully uncovered. The thermometer was in perfect condition and registered  $-13.6^{\circ} F.$  It was reset and left upon the mountain a second year. Professor Le Conte was unable to make the ascent of the mountain in 1899, but Prof. H. I. Randall of the Civil Engineering Department of the State University visited the spot in July and obtained the reading. In this case it was  $-17.6^{\circ} F.$

It would be instructive to obtain the minimum winter temperatures of a number of high peaks distributed along the crest of the range from Lake Tahoe to Mount Whitney.

In reference to these Mr. McAdie writes as follows:

The above experiments were made under the auspices of this office, with a view of determining the minimum winter temperatures at the top of the Sierra Nevada Mountains. Mr. J. N. Le Conte, son of Prof. Joseph Le Conte, is an instructor in mechanical engineering in the University of California, and also one of the officers of the Sierra Club. He is an acknowledged authority upon the High Sierra, and I consider that the Bureau has been fortunate in obtaining the services of this gentleman for the experiment.

It is very interesting to note that the minimum temperature on Lyell, elevation 13,040 feet, was  $-17^{\circ}$ , while at Bodie, elevation 8,248 feet, the lowest temperature was  $-30^{\circ}$ . One of the objective points of meteorological investigation at present is the determination of the thickness of the stratum of air in which cold waves are thought to have their origin. I believe it is an accepted fact that the mean temperature of the Plain region is lower than that of the Rocky Mountains, although the latter are from 5,000 to 6,000 feet high. The experiment on the Sierras seems to confirm this. From many other standpoints the experiment is also interesting.

The accuracy of these results depends in part upon the assumption that the thermometer was well ventilated at the time of minimum temperature. So many accidents are liable to occur that it would be desirable to expose two or more thermometers in different places as a check on each other.

#### AUGUST WEATHER ON THE PACIFIC COAST.

As the temperatures and rainfall on the Pacific coast were quite unusual during August it is interesting to compare the remarks of the respective section directors.

In the California Report, Mr. McAdie says:

The mean temperature for the State was  $5.1^{\circ} F.$  below the normal. The precipitation was 0.05 inches in excess. The prevailing direction of the wind was west. The central and northern portions of the State experienced unusual and quite severe electrical storms during the first part of the month.

In the Oregon Report, Mr. B. S. Pague says:

The total rainfall during this August has been about 4 inches along the coast, 3 inches in the Willamette Valley, 1 to 2 inches in southern Oregon and 1 inch in eastern Oregon. With rare exceptions the rainfall was heavier than in any previous August. \* \* \* The causes producing the August rains extend back over a considerable period of time. Under the normal movement of the summer areas of high pressure, it is not possible for rain, such as fell this month, to occur. \* \* \* Briefly the cause of the rains was the weakness of the Pacific coast highs, their sluggish movements, the development and strength of the low which came down from the north, uniting with and assisting in the development of lows over southeastern Oregon and the surrounding region. The abnormal August weather of the Pacific slope was preceded by, first, the imperfect movement of the ocean highs in 1898; second, the almost unprecedented cold period of February, 1899; and third, the cool, cloudy, and wet weather of April and May, and the low temperatures of June.

In the Washington Report, Mr. Salisbury says:

The unseasonable character of the month was more pronounced than for any August on record. Its phenomenal character deserves something more than passing notice. The temperature of August has been abnormally low and the precipitation abnormally great. \* \* \* It would be futile to write in learned terms about the unusual southward path of low barometer areas and the unusual frequency of such lows, as producing the unusual rains, or about the unusually low latitude of high areas on the coast producing the cool weather. What is of value to know is what has caused the unusual southward track and unusual number and continuance of low areas during August just past, or, perhaps preferably, the reason or reasons why the high areas were this year in an unusual position. Such knowledge might be of utility in enabling us to foresee seasonable or unseasonable conditions; unfortunately, it has not, as yet, been attained.

#### THE CALCULATION OF THE RESULTANT WIND.

Our readers will have noticed that during the past two years we have published in Table VII the resultant direction of the wind computed from two observations, 8 a. m. and 8 p. m. daily. We have also given the average movement of the wind in Table VI, for every hour of the day.

Chart IV for each month shows the resultant winds, graphically, in connection with the isobars which are also the mean of observations at 8 a. m. and 8 p. m. It is commonly supposed that there is a close connection between the wind and the distribution of pressure at any given moment. Consequently, the mean pressures and mean winds at those moments should bring out that relation more clearly. This is a sufficient argument to justify the usage of the WEATHER REVIEW. On the other hand, as the winds are often local and are always subject to small differences of pressure, not shown by means of the ordinary barometric observations, and especially, because the winds at the surface are largely affected by currents descending from the upper atmosphere, where both wind and isobars differ very much from what prevails at sea level, therefore, there are many discrepancies in the observed relation between the resultant winds and the average isobars. These discrepancies would not be diminished if the isobars and the winds were based upon twenty-four observations per day instead of two.

In reply to a recent letter maintaining that our so-called resultants are not absolutely correct, and should be deduced from more frequent observations and by a careful consideration of the measured velocity of the wind, the following reply was sent. Those interested in the subject should study the discussions published in the MONTHLY WEATHER REVIEW during 1893 and 1894.